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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/392,124      | 09/08/1999  | DOUGLAS A. CHRISSAN  | 8X8S.239PA          | 9597             |

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EXAMINER

AZAD, ABUL K

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2654

DATE MAILED: 04/07/2004

19

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/392,124

Applicant(s)

CHRISSAN ET AL.

Examiner

ABUL K. AZAD

Art Unit

2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. This action is in response to the communication filed on January 14, 2004.
2. Claims 1-32 are pending in this action.
3. In view of the applicant's arguments the drawing objection set forth in the previous office action (Paper No. 17) has been withdrawn.
4. The applicant's arguments with respect to claims 1-32 have been fully considered but they are not deemed to be persuasive. For examiner's response to the applicant's arguments or comments, see the detailed discussion in the Response to the Arguments section.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-27 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bialik (US 5,568,588) in view of Adoul et al. (US 5,754,976).

As per claim 1, Bialik teaches, "in a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, a method of analyzing the input speech signal comprising:"

“generating from the target vector and the short term characteristics, a plurality of variable-amplitude pulses” (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector generator, element 20 pulse location determiner and element 38 pulse which matches target vector; col. 4, lines 12-51, particularly reads on, “typically has a value of 3 separate gain levels . . . the gain level selector 24 receives the gain range produced by gain range determiner 22 and move through the gain values within the gain range. It output, on output line 32, is current gain level for which sequence of equal amplitude pulses to obtained”, from this statement it is clear that for each gain level the system will obtained a different amplitude of pulses; also teaches at col. 5, line 55 to col. 6, lines 27); and

“outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector” (col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines the value of global criterion  $GC_j$  for each gain level  $j$ ”, where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses).

Bialik does not explicitly teach, sequences of variable-amplitude pulses and each of the sequence having a different average amplitude value. However, Adoul teaches, “generating from the target vector and the short term characteristics, a sequences of variable-amplitude pulses, each of the sequence having a different average amplitude value” (see encoding principle). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Adoul’s teaching in the invention of Bialik because Adoul teaches a very good performance can

be achieved with variable-amplitude pulses without paying a heavy price (col. 10, lines 7-18).

As per claim 2, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 3, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"means for generating from the target vector and the short term characteristics, a plurality of variable-amplitude pulses" (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector generator, element 20 pulse location determiner and element 38 pulse sequence which matches target vector; col. 4, lines 12-51, particularly reads on, "typically has a value of 3 separate gain levels . . . the gain level selector 24 receives the gain range produced by gain range determiner 22 and move through the gain values within the gain range. It output, on output line 32, is current gain level for each sequence of equal amplitude pulses to obtained", from this statement it is clear that for each gain level the system will obtained a different amplitude of pulses; also teaches at col. 5, line 55 to col. 6, lines 27); and

"means for outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines the value of

global criterion  $GC_j$  for each gain level  $j$ ", where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses).

Bialik does not explicitly teach, sequences of variable-amplitude pulses and each of the sequence having a different average amplitude value. However, Adoul teaches, "generating from the target vector and the short term characteristics, a sequences of variable-amplitude pulses, each of the sequence having a different average amplitude value" (see encoding principle). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Adoul's teaching in the invention of Bialik because Adoul teaches a very good performance can be achieved with variable-amplitude pulses without paying a heavy price (col. 10, lines 7-18).

As per claim 4, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 5, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"an analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of variable-amplitude pulses" (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector generator, element 20 pulse location determiner and element 38 pulse sequence which matches target vector; col. 4, lines 12-51, particularly reads on, "typically has a value of 3 separate gain levels .

. . the gain level selector 24 receives the gain range produced by gain range determiner 22 and move through the gain values within the gain range. Its output, on output line 32, is current gain level for each sequence of equal amplitude pulses to be obtained", from this statement it is clear that for each gain level the system will obtain a different amplitude of pulses; also teaches at col. 5, line 55 to col. 6, lines 27);

"the analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines the value of global criterion  $GC_j$  for each gain level  $j$ ), where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses).

Bialik does not explicitly teach, sequences of variable-amplitude pulses and each of the sequence having a different average amplitude value. However, Adoul teaches, "generating from the target vector and the short term characteristics, a sequence of variable-amplitude pulses, each of the sequence having a different average amplitude value" (see encoding principle). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Adoul's teaching in the invention of Bialik because Adoul teaches a very good performance can be achieved with variable-amplitude pulses without paying a heavy price (col. 10, lines 7-18).

As per claim 6, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 7, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"a multi-pulse analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of variable-amplitude, variable-sign and variably-spaced pulses, each of said pulses having variable amplitudes and variable signs" (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector generator, element 20 pulse location determiner and element 38 pulse sequence which matches target vector; col. 4, lines 12-51, particularly reads on, "typically has a value of 3 separate gain levels . . . the gain level selector 24 receives the gain range produced by gain range determiner 22 and move through the gain values within the gain range. Its output, on output line 32, is current gain level for each sequence of equal amplitude pulses to obtained", from this statement it is clear that for each gain level the system will obtain a different amplitude of pulses, so for out put of multiple gain levels of pulses will obtain a sequence of variable-amplitude; also teaches at col. 5, line 55 to col. 6, lines 27; also Bialik teaches, "the pulse sequence is series of positive and negative pulse sequence having the current gain");

"the multi-pulse analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude, variable-sign, variably-spaced pulses which, according to a maximum likelihood criterion, most closely represents the target vector" (col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines

the value of global criterion  $GC_j$  for each gain level  $j$ ", where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses and variable-sign and variably-spaced pulses).

Bialik does not explicitly teach, sequences of variable-amplitude pulses and each of the sequence having a different average amplitude value. However, Adoul teaches, "generating from the target vector and the short term characteristics, a sequences of variable-amplitude pulses, each of the sequence having a different average amplitude value" (see encoding principle). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Adoul's teaching in the invention of Bialik because Adoul teaches a very good performance can be achieved with variable-amplitude pulses without paying a heavy price (col. 10, lines 7-18).

As per claim 8, Bialik teaches, " wherein the target vector is matched using a perceptual weighting criterion" (col. 6, line 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 9, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (Fig. 5, elements 10, 12, and col. 5, lines 1-15, impulse response is a function of short-term characteristics  $a_l$  provided along line 17 from analyzer 10").

As per claims 10-27, they are interpreted, thus rejected for the same reasons set forth in the rejection of claims 1-9.

As per claim 29, Bialik teaches, "wherein the pulse-train sequence modification function is based on a linear function" (col. 4, line 55 to col. 5, line 65, equation 2 is a linear function).

As per claim 30, Bialik teaches, "wherein the pulse-train sequence modification function is based on the short-term characteristics of the input speech signal" (col. 4, lines 55-65, short-term characteristic).

As per claim 31, Bialik teaches, "wherein the pulse-train sequence modification is based on the long-term characteristics of the input speech signal" (col. 3, lines 41-48, long-term analyzer).

As per claim 32, Bialik teaches, "wherein the pulse-train sequence modification function is based on the excitation signal from previous frames" (col. 6, lines 11-18, reads on "in step 62, determiner 25 updates the local criterion with the previous pulse as follows equation 7").

7. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bialik et al. (US 5,568,588) in view of Adoul et al. (US 5,754,976) as applied to claim 25 above, and further in view of Sklar (Digital Communications Fundamentals and Application).

As per claim 28, Bialik in view of Adoul do not explicitly teach modifying the pulse train based on the exponential function. However, Sklar teaches, in the speech signal processing to use pulse trains constructed based on the exponential function (Page 63, equations 2.10 and 2.11). It would have been obvious to one of ordinary skill in the art at the time of the invention to use pulse-train sequence modification function is based

on the exponential function because output speech quality is greatly increased, and perceptually smooth.

### ***Response to Arguments***

8. The applicant argues: "moreover, the '976 reference fails to correspond to the asserted ones of Applicant's claim limitations. As discussed above, the instant invention involves a plurality of sequences, where each sequence has variable-amplitude pulses. In direct contrast, the '976 reference teaches that there are N non-zero-amplitude pulses in a sequence and each has an amplitude equal to the amplitude pre-assigned to the position p of the non-zero-amplitude pulse. See column 14, lines 19-26. Thus, each of the pulses has equal amplitudes, and not the variable amplitudes as set forth in Applicant's claims".

The examiner respectfully disagrees with the applicant's assertion because pre-assigned pulses amplitudes are not equal amplitude. The applicant has misinterpreted the teaching of Adoul's Patent, Adoul teaches at col. 12, lines 24-33, "the purpose of the amplitude selector 112 is to pre-establish a function  $S_p$  between the positions p of the codevector waveform and the q possible values of the pulse amplitudes. The pre-established function  $S_p$  is derived in relation to speech signal prior to codebook search. More specifically, pre-establishing this function consists of pre-assigning, in relation to the speech signal, at least one of the q possible amplitudes to each position p of the waveform". From the above statement it is clear that the pre-established function  $S_p$  is derived in relation to speech signal prior to codebook search, it does not mean that

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each pulses has equal amplitudes, however, it says that each position has q possible amplitudes.

9. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, suggestion to combine the references is taken from the knowledge generally available to one of ordinary skill in the art.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Contact Information***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Abul K. Azad** whose telephone number is **(703) 305-3838**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Richemond Dorvil**, can be reached at **(703) 305-9645**.

Any response to this action should be mailed to:

**Commissioner for Patents**

**P.O. Box 1450**

**Alexandria, VA 22313-1450**

Or faxed to:

**(703) 872-9314**

(For informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

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Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center's Customer Service Office at telephone number **(703) 306-0377**.

Abul K. Azad

April 2, 2004



**RICHEMOND DORVIL**  
**SUPERVISORY PATENT EXAMINER**